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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,512	06/23/2005	Nobuo Oi	2185-0765PUS1	6638

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EXAMINER
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TESKIN, FRED M

ART UNIT	PAPER NUMBER
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1713

DATE MAILED: 03/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/540,512

Applicant(s)

OL ET AL.

Examiner

Fred M. Teskin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>112805</u> . | 6) <input type="checkbox"/> Other: ____.  |

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The preliminary amendment of June 23, 2005 has been entered. Claims 1-4 are currently pending and under examination.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6288193 to Iseki et al ("Iseki").

The claimed invention is a process for producing an olefin-based copolymer, which comprises copolymerizing at least one olefin selected from the group consisting

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of ethylene and straight chain  $\alpha$ -olefins, a vinyl compound (I) described below and a polyene (II) described below:

Vinyl compound (I): a vinyl compound represented by the general formula  $\text{CH}_2=\text{CH-R}$ , wherein the substituent R is a saturated hydrocarbon group and steric parameters Es and B1 of the substituent R are respectively -1.64 or less and 1.53 or more; and

Polyene (II): a compound having two or more of ethylene bonds and at least one combination of two ethylene bonds in which those are bonded to each other through at least three carbon atoms.

Iseki discloses a process for producing an olefin-based copolymer, which differs from the claimed process only in that the copolymerization of ethylene, a vinyl compound (A) (corresponding to vinyl compound (I) as claimed) and a polyene (II) is not disclosed in a single embodiment; rather, the copolymerization of ethylene, vinylcyclohexane and 1-hexene is exemplified (e.g., Example 3).

Nevertheless, Iseki lists specific species of applicants' polyene (II) as members of a relatively small genus of addition polymerizable monomers usable as a copolymerization component in addition the vinyl compound (A). Thus at column 6, lines 20-29 and column 8, line 63 to column 9, line 5, Iseki enumerates eighteen species of comonomers including alpha-olefins like 1-hexene and the diolefins 1,7-octadiene and 1,9-decadiene, which each qualify as an aliphatic polyene as per claims 1 and 4. This teaching of alternativeness between  $\alpha$ -olefins and diolefins would have led

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one to reasonably expect the specifically named diolefins to perform equivalently to 1-hexene in the disclosed process.

The expectation of equivalent performance would have provided the requisite motivation for one of ordinary skill in the art to modify Iseki by utilizing 1,7-octadiene or 1,9-decadiene in place of 1-hexene in the disclosed copolymerization process. Further, where reactive modification of the copolymer is desired, additional incentive exists for one of ordinary skill to select such an  $\alpha,\omega$ -diene as a copolymerization component of Iseki, viz., the knowledge that such comonomers will provide residual pendant unsaturation which can be readily exploited as a reactive site for the desired modification reaction(s).

Accordingly, the subject matter of claims 1-4 is held to have been obvious to one having ordinary skill in the art at the time of applicants' invention.

Claims 1, 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5837791 to Sagane et al ("Sagane"), alone or in view of the evidence provided by Oi et al.

Sagane discloses a process for producing an unsaturated copolymer of ethylene, the process including the step of copolymerizing (i) ethylene, (ii) an  $\alpha$ -olefin of 3 to 20 carbon atoms and (iii) a straight- or branched-chain non-conjugated triene or tetraene having one vinyl group in the molecule (col. 1, ll. 10-15 and col. 2, ll. 20+). Specific disclosure is provided to copolymerizing ethylene, propylene and an aliphatic triene conforming to applicants' polyene (II) as claimed (See, Examples 1, 2 and 4).

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Sagane differs from the claimed process only in that the copolymerization of ethylene, a polyene (II) and a vinyl compound (I) is not disclosed in a single embodiment.

However, as specific examples of  $\alpha$ -olefin (ii), Sagane names 3-methyl-1-butene and 3-methyl-1-pentene, which are vinyl compounds known in the art to possess the steric parameters (Ea and B1) requisite to the applicants' vinyl compound (I). In this regard, Oi et al is relied upon as evidence that 3-methyl-1-butene and 3-methyl-1-pentene are known to possess Es and B1 parameters meeting the terms of claim 1 (see paragraph 0023 of Oi et al). Sagane then names propylene, 1-butene, 1-hexene and 1-octene as preferred (col. 6, ll. 55-65).

Given the close structural relationship of 3-methyl-1-butene and 3-methyl-1-pentene to propylene, 1-butene and 1-hexene (i.e., neighboring homologues or position isomer), one would have reasonably expected the former to possess properties similar to the preferred species, including similar copolymerizability with ethylene and the nonconjugated triene or tetraene (iii).

Such expectation of similar performance would have provided ample incentive for the ordinary practitioner to modify Sagane by utilizing 3-methyl-1-butene or 3-methyl-1-pentene as the  $\alpha$ -olefin (ii) in the disclosed copolymerization process; thus the subject matter of claims 1, 2 and 4 would have been *prima facie* obvious to one having ordinary skill in the art at the time of applicants' invention.

No claims are allowable at this time.


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Any inquiry concerning this communication should be directed to Examiner F. M. Teskin whose telephone number is (571) 272-1116. The examiner can normally be reached on Monday through Thursday from 7:00 AM - 4:30 PM, and can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The appropriate fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

FMTeskin/03-03-06



**FRED TESKIN**  
**PRIMARY EXAMINER**  
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